

AUSTRALIAN PLANT DISEASE RECORDER

Volume 13, Number 2

April, 1961

Edited by

P.G. Valder, Biology Branch,

Department of Agriculture,

Box 36, G.P.O.,

Sydney.

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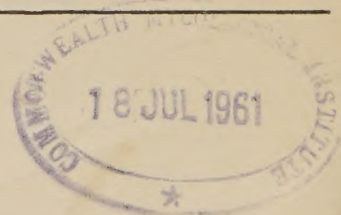
PLANT DISEASE NOTES

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A.V. HILL

For confidential circulation to plant pathologists in Australia

PLEASE DO NOT ABSTRACT.



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FIELD CROPS AND PASTURE PLANTS

THE EFFECT OF GIBBERELLIC ACID ON TOBACCO PLANTS DWARFED BY YELLOW DWARF VIRUS:

In 1957 Maramorosch (Science 126, 651-2) claimed that gibberellic acid caused reversal of stunting in plants infected with the leaf hopper transmitted viruses - corn stunt, aster yellows and wound tumor. In Victoria during the 1959-60 season, G.A. was used as a spray on field tobacco plants stunted by the leaf-hopper transmitted virus of yellow dwarf. On three occasions at fortnightly intervals 25 plants in each of 2 fields were sprayed with G.A. 20ppm and Tween 20 at 1 part per 3000. The rate was 10 ml. per plant. Unsprayed plants in adjoining rows were used as controls. Plant height, leaf number and size of largest leaf were recorded at each spraying and at two weeks after the last spray treatment.

G.A. did not have any effect on leaf size or number of leaves. Spraying delayed senescence slightly as judged by numbers of living and dead leaves ($p < .05$). There was a significant increase in the height of sprayed plants ($p < .001$). This difference was of the order of only 8 cm. and difficult to detect by observation alone. Healthy plants were approximately three times the height of the yellow dwarf plants.

Leaves of sprayed plants were greener and longer, had wavy margins and appeared thinner to the touch than the unsprayed. They were more susceptible to attack by blue mould than the unsprayed and in this were comparable with yellow dwarf plants in a field that had previously been under clover pasture.

A.V. HILL

C.S.I.R.O.,

CANBERRA.

J.W. MEACHER

Department of Agriculture,

MELBOURNE.

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A.V. HILL

C.S.I.R.O.,

CANBERRA

CLOVER CYST NEMATODE IN VICTORIA:

A cyst-forming nematode occurring on clover has been found for the first time in Victoria and, to the writer's knowledge, for the first time in Australia.

Numerous cysts were found on the roots of white clover (Trifolium repens) growing in a lawn at the rear of the Plant Research Laboratory, Burnley.

Measurements of cysts, eggs and larvae are within the ranges described for Heterodera trifolii (The cyst-forming species of Heterodera) by Franklin 1949.

Mean measurements are as follows:

Cysts: Length 630 μ

Breadth 380 μ

Ratio of length/breadth - 1.7 to 1

Eggs: 113 μ x 45 μ

Length of larvae: 498 μ

Although several plant and soil samples were examined, no males could be detected.

Characters of the vulval cone agree with those described for H. trifolii by B. A. Cooper 1955 (Soil Zoology).

Host range studies to further confirm the identity of the species are now in progress.

J.W. MEAGHER

Department of Agriculture,

MELBOURNE.

J.W. MEACHER

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WHITE CLOVER MOSAIC VIRUS: APPLESCABBAGE YELLOWS:

White clover plants in Canberra commonly show conspicuous chlorotic mottling and streaks in early spring. A virus isolated from such plants closely resembled in host range and symptomatology the New Zealand clover mosaic virus described by P.R. Fry. Antigen prepared from French bean infected with the Canberra virus reacted positively in both a gel double diffusion test and a ring precipitin test with antiserum obtained from Dr. P.R. Fry.

White clover mosaic virus antisera have been exchanged among Canadian, Dutch German and United States laboratories. The resulting positive serological reactions with local isolates indicate that white clover mosaic in these areas is caused by closely related strains of one virus. Dr. Fry's antiserum has given positive reactions with Canadian, Dutch and United States viruses, indicating that it, also, is white clover mosaic virus.

It is apparent that greater resistance to this disease in commercial seed lots will be required at some future date. K.G. SWENSON probably available overseas in places where this disease has been long established.

Division of Plant Industry,

C.S.I.R.O.

J.C. JOHNSON

CANBERRA.

Department of Agriculture and Stock,

BRISBANE.

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K. G. SWENSON

Division of Plant Industry,

C.S.I.R.O.

CANBERRA.

FUSARIUM WILT IN PEAS VEGETABLES

CABBAGE YELLOWS:

This disease, caused by Fusarium oxysporum f. conglutinans, has made its appearance in a cabbage crop at Ormiston.

The grower concerned claims that the trouble was first in evidence during the 1959-60 summer season.

In pot inoculation tests, it has been observed that a sample of the variety All Seasons was completely resistant to isolates from the Ormiston outbreak. Samples of the varieties Utility, Enkhuizen Glory, Sugarloaf and Early Jersey Wakefield contained from 25 to 50 per cent of resistant types. Ballhead hybrid, Copenhagen Market, Henderson's Succession and Vanguard were completely susceptible. First Early Improved showed an intermediate reaction, taking considerably longer to succumb.

It is apparent that greater resistance to this disease in commercial seed lots will be required at some future date. Such material is probably available overseas in places where this disease has been long established.

J.C. JOHNSON

This is the first record of occurrence of a Fusarium wilt strain. Department of Agriculture and Stock, careful watch has been kept for its occurrence over the past four seasons.

BRISBANE.

I.D. GEARD

Department of Agriculture,
TASMANIA.

VEGETABLESCABBAGE YELLOW:

This disease, caused by Fusarium oxysporum f. conglutinans, has made its appearance in a cabbage crop at Ormiston.

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J. C. JOHNSON

Department of Agriculture and Stock,

BRISBANE.

FUSARIUM WILT IN PEAS IN TASMANIA:

In November 1960 a few plants in a canning pea crop at Ulverstone were observed to wilt at or before flowering time and examination showed reddish vascular discolouration extending up the stem. There was no apparent rotting of the roots and no external discolouration or shrinking of the tissues at ground level. A Fusarium was consistently isolated from the affected plants and obtained in pure culture. The pathogenicity of the isolate was demonstrated by dipping the roots of 14-day-old seedlings in a suspension of mycelium and spores, and replanting. Plants inoculated in this way showed a pale leaf colour, and down-curling of the young leaves in the initial stages and finally complete yellowing, wilting and death. Infected plants showed the typical reddish brown vascular discolouration found in the field and the symptoms indicate that the fungus is a race of Fusarium oxysporum, f. pisi.

The isolate obtained is able to wilt varieties allegedly resistant to races 1 and 2 of the pathogen. When New Zealand Wilt Resistant Greenfeast, ordinary unselected Greenfeast, New Zealand Wilt Resistant William Massey Selection L4, New Zealand Wilt Resistant Onward Selection E2, New Era and Cooper's 75 were inoculated there was a high degree of mortality (up to 90 per cent) in all varieties. The isolate is either a race other than 1 or 2 (a Race 3 has been described) or else it has been enabled to attack resistant varieties by the heavy inoculation used.

This is the first record of occurrence of a Fusarium wilt strain on peas in Tasmania, although a careful watch has been kept for its occurrence over the past four seasons.

I.D. GEARD

Department of Agriculture,
TASMANIA.

THE HISTORY OF THE UNITED STATES

The history of the United States is a story of a people who have grown from a small colony of English settlers to a great nation. The story begins in 1492 when Christopher Columbus discovered the New World. The first English settlers came to the United States in 1607, and the first American Revolution was fought in 1776. The United States has since grown into a great nation, and its history is a story of progress and achievement.

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A NEMATODE ROTTING POTATO TUBERS IN TASMANIA:

In February 1961 newly-dug Up-to-Date tubers from a property in the Tunnack area were examined. Slightly sunken areas, $\frac{1}{4}$ " inch to $\frac{1}{2}$ " inch diameter, were present on the surface of some tubers. Others appeared normal, but on close examination showed fine punctures in the surface. Cutting through the tubers revealed dry, granular, grey to brown rotting areas up to $\frac{1}{2}$ " inch in diameter and $\frac{1}{4}$ " inch deep beneath the sunken and punctured parts of the surface.

Microscopic examination showed large numbers of nematodes (Ditylenchus spp.) through the rotted areas, but concentrated near the margins of the lesions. Eggs, larvae and adults of both sexes were all present. No other organism which could cause this condition was detected.

A crude suspension of nematodes were prepared by dicing affected tubers onto a sieve of mesh .0237 inch just covered with tapwater. Bismark tubers in sterilized soil were drenched with this suspension. After four weeks slight rotting was observed and Ditylenchus spp. were recovered from the rotting tissue. At intervals the condition of other Bismark tubers will be noted.

The morphology of the nematode suggests that it is Ditylenchus destructor, but more detailed examination is necessary before any definite diagnosis is made.

BARRIE THISTLETHWAYTE

Department of Agriculture,

HOBART.

TOBACCO MOSAIC VIROSIS OF POTATO:

A number of potato scions on tomato rootstocks (variety Grosse Lisse) grown in an aphid-proof glasshouse for potato breeding work were affected by a necrotic spotting suggestive of Tomato Spotted Wilt. Spotting on the potato leaflets began as a pale brown mottle, and developed in some cases to the stage of complete leaflet necrosis. Necrosis was in certain crosses accompanied by a server interveinal and marginal chlorosis. Scions were stunted and produced aerial tubers.

The tomato stocks developed lateral shoots with an interveinal chlorosis which was especially severe on the lateral leaflets.

The causative virus was very readily transmitted from the potato scions and the tomato stock suckers to Ailsa Craig tomato and Nicotiana glutinosa. Six hours ageing at 25°C and heating to 45°C for 15 minutes did not destroy infectivity. The tomato spotted wilt virus would not have survived these treatments. On Ailsa Craig tomato the main symptoms were a purple mottle of leaves, a terminal necrosis of leaflets and elongated purple lesions on the stems. On N. glutinosa local lesions appeared after four days, approximately 1 mm. across, light brown with a darker margin, becoming confluent. After 14 days a girdling necrosis of the stem nearest the inoculated leaves caused the death of young plants.

It is suggested that a strain of tobacco mosaic virus was present in the tomato rootstocks, and became graft transmitted to the potato scions.

P.J. SAMPSON

Department of Agriculture,

HOBART.

CHOANEPHORA FRUIT ROT OF MARROW:

Choanephora cucurbitarum (Berk. & Rav.) has been associated with blighted blossoms and young rotting marrow fruit at Rydalmere. This fungus was also isolated from a mature rotting marrow.

Choanephora cucurbitarum has been recorded in New South Wales for many years but has been reported only rarely.

BARBARA BALLANTYNE

Department of Agriculture,

SYDNEY.

POWDERY MILDEW OF ROCKMELON:

The breakdown of resistance to powdery mildew of the variety P.M.R. 45 in 1959 (A.P.D.R. 11 (3), 23) and of the varieties P.M.R. 5 and P.M.R. 6 in 1960 (A.P.D.R. 12(3), 28) has raised a problem in that there are at present no resistant varieties available in New South Wales, and a small-scale trial to test the efficiency of a number of fungicides was undertaken at Rydalmere this year.

The trial using Karathane(0.025 per cent), Bayer 4964 (0.009 per cent) and HOE 2784(0.05 per cent) was carried out on the variety Bender's Surprise, with control plants of varieties P.M.R. 45, P.M.R. 5 and P.M.R. 6 included. All three fungicides particularly the Karathane and Bayer 4964 have been sufficiently effective to warrant their use in more extensive trials on the Murrumbidgee Irrigation Area and in the Lower Murray District.

While control plants of the variety Bender's Surprise were severely affected, those of P.M.R. 45, P.M.R. 5 and P.M.R. 6 were free from powdery mildew, indicating a difference between the race present in this area to that present in other parts of the State.

BARBARA BALLANTYNE

Department of Agriculture,

SYDNEY.

FRUITAPPLE RINGSPOT VIRUS:

This year Apple Ringspot virus was recognised, by symptom expression only, on Delicious apple specimens from Young and Orange. This disease has previously been observed in N.S.W. only on the Granny Smith variety.

Symptoms were seen only on the fruit, which had irregular brown patches with a rough surface and a scaly margin. On the more mature specimens a narrow, smooth brown band developed around the spots. Some concentric ring patterns were observed on a few of the specimens, while some showed russet sectors.

R. D. PARES

Department of Agriculture,

SYDNEY

THE HISTORY OF THE

The first part of the history of the world is the history of the human race. It is a history of the progress of the human mind, of the growth of the human soul, of the development of the human spirit. It is a history of the human race, of the human mind, of the human soul, of the human spirit.

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THE HISTORY OF THE

A SPECIES OF HETERODERA ON FIG ROOTS:

During examination of a herbarium specimen of root knot Meloidogyne sp) of figs collected at Griffith in 1959, a few cysts of a species of Heterodera were found attached to some of the fig roots. The cysts were shiny and light brown in colour and approximately 0.5 mm long by 0.2 - 0.25 mm wide. Detailed examination of the cyst wall showed that its surface had a very definite pattern of wavy lines on it, very similar to those illustrated by Hesling for H. weissi (Hesling, J.J. The identification of Heterodera cysts. Plant Nematology, Min. Agric., Fisheries & Food Tech. Bull. No.7, 64-70, 1959). An examination of the vulval cone was made and the species appears to fall into the Bifenestrata group. This group contains only a few species, of which H. fici Kirjanova 1954 originally described from Russia is one. This species has been recorded also in Great Britain, California and Florida (Christie, J.R., Plant Nematodes. Their Bionomics and Control, 1959) and in cyst wall and vulval cone characteristics, the Griffith species appears very similar to it. The writer would be grateful for information about any other records of Heterodera on Ficus spp. in Australia. An attempt is being made to collect further material of this species for more detailed examination.

J. WALKER

Department of Agriculture,

SYDNEY.

EXPERIMENTAL INFECTION OF STRAWBERRY PLANTS WITH THE TOMATO BIG BUD VIRUS:

The tomato big bud virus was transmitted to strawberry plants (*Fragaria vesca*) kindly supplied by L.L. Stubbs, by means of dodder (*Cuscuta campestris*). Two sources of big bud virus produced similar symptoms on strawberry: one has been maintained for some years in the glasshouse on tomato and came originally from lucerne; the other was obtained more recently from white clover plants collected at Armidale by D.J. Goodchild. Both sources of virus caused typical big bud symptoms of gigantism and virescence on tomato.

Five of 27 strawberry plants to which infected dodder was attached, developed symptoms two to four months later. Symptoms were most pronounced on young leaves which developed very short petioles and were chlorotic, curled and reduced in size. Older leaves developed twisted petioles and became necrotic. All infected plants died one to two months after symptoms were first observed, and prior to flowering.

Some diseased plants produced chlorotic stolons with short internodes. Daughter plants from these formed rosettes of small leaves but survived only a few weeks.

Attempts are being made to transmit the virus to a commercial variety of strawberry.

KATIE HELMS

Division of Plant Industry,

C.S.I.R.O.,

CANBERRA.

THE EFFECT OF TEMPERATURE ON THE GROWTH OF THE PLANT

The effect of temperature on the growth of the plant was studied by growing the plants at different temperatures. The results are shown in the following table. The plants were grown in a glasshouse and the temperature was controlled by means of a thermostat. The plants were grown in a glasshouse and the temperature was controlled by means of a thermostat. The plants were grown in a glasshouse and the temperature was controlled by means of a thermostat.

Five of 17 strawberry plants growing in the glasshouse were selected for the experiment. The plants were grown in a glasshouse and the temperature was controlled by means of a thermostat. The plants were grown in a glasshouse and the temperature was controlled by means of a thermostat. The plants were grown in a glasshouse and the temperature was controlled by means of a thermostat.

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TABLE I

Results of the experiment

Table of results

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PHYTOPHTHORA RESISTANCE IN CLEOPATRA MANDARIN:

The Cleopatra mandarin has attained popularity as a citrus rootstock in the U.S.A. where it is reported to be moderately resistant to Phytophthora root and collar rots.

Cleopatra seed was obtained from Monak near Mildura in 1954 for use in rootstock experiments in Queensland. Mr. W. Pont subsequently carried out Phytophthora parasitica wound inoculations with a number of citrus varieties at Cairns. He found in his tests that the Mildura strain of Cleopatra was moderately susceptible to P. parasitica which is the common causal organism of citrus root and collar rot in Queensland.

Seed of a reputable rootstock strain of Cleopatra was then obtained from the University of Florida, Agricultural Experiment Station, Lake Alfred, and one-year-old seedlings were compared for P. parasitica resistance with similar seedlings of the Mildura strain. The pots were inoculated in the greenhouse in Brisbane in two ways.

- (1) Corn meal sand cultures were dug into the pots
- (2) Fragments of the cultures were placed against scalpel wounds made in the stems just under the soil.

The Pots were kept in saucers of water.

After ten months the results could be assessed as follows:-

Strain of Cleopatra	No. of Plants affected/No. inoculated			
	Wound Inoculation	Soil Inoculation	Wounded Control	Untreated Control
Florida	+ 6/6	* 2/6	0/4	0/4
Mildura	∅ 6/6	△ 6/6	0/4	0/4

+ Affected plants four times size of similar Mildura strain plants despite presence of some root rot.

∅ Five plants dead.

* Trace of root rot in affected plants.

△ One plant dead; remainder stunted and chlorotic.

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- (1) Corn meal sand cultures were dug into the pots
- (2) Fragments of the cultures were placed against scapel wounds made in the stems just under the soil.

The Pots were kept in saucers of water.

After ten months the results could be assessed as follows:-

Strain of Cleopatra	No. of plants affected/No. inoculated			
	Wound Inoculation	Soil Inoculation	Wounded Control	Untreated Control
Florida	+ 5/6	* 2/6	0/4	0/4
Midlura	Δ 5/6	Δ 5/6	0/4	0/4

+ Affected plants four times size of similar Midlura strain plants despite presence of some root rot.

Δ Five plants dead.

* Trace of root rot in affected plants.

Δ One plant dead; remainder stunted and chlorotic.

It is apparent from this small test that the Florida strain is more resistant than the Mildura strain. Trees of the former line have now been planted out for seed production.

B.L. OXENHAM

Department of Agriculture and Stock,
BRISBANE.

ORNAMENTALS

WHITE RUST DISEASE OF GERBERAS:

During February and March, 1961, samples of gerbera leaves infected with the disease white rust were received from a number of suburbs in the Sydney metropolitan area and also from Murwillumbah and Lismore. It thus appears that the disease has become quite widespread since it was first recorded in Sydney in 1959, and Brisbane in 1960. In some cases infection has caused almost complete defoliation of the plants. A characteristic symptom has been the presence of large reddish-purple necrotic areas on the upper surface associated with relatively small sori on the under surfaces of the leaves.

J. ANDERSON

Department of Agriculture,

SYDNEY.

MISCELLANEOUS

PYTHOMYCES CHARTARUM IN TASMANIA:

Following New Zealand and Victorian reports on the relation between facial eczema in sheep and the fungus *Pythomyces chartarum*, The Animal Health Service requested that a survey be conducted to determine whether the fungus occurs in Tasmania.

It was decided to base the initial survey on an examination of samples of wiggings, as it was felt that spores would be trapped in facial wool. About sixty samples have been examined, and the organism detected on a number of properties. The simple technique employed is described here, as it is felt it may be of interest to others. It is not regarded as completely reliable, but it is useful in providing information on which properties merit further investigation by more accurate methods.

A 1 gram composite sample of the outer wool is prepared, and is immersed in 50 mls. of 1 per cent. teepol solution. It is shaken for 30 minutes and then filtered through muslin. The liquid is centrifuged in an angle-head centrifuge, and a drop of residue taken with a fine pipette and placed on a slide. The cover slip is sealed with Glyceol to prevent evaporation pending examination. The slide is then examined for the presence of the characteristic spores of the fungus.

The fungus has been detected in 30 of the 60 samples examined. Infected properties have been almost entirely in the King Island, Latrobe and Hurrick (North East) districts and most samples from the Midlands and parts of the North-West, other than a small area around Latrobe, have been free of infection.

Liver damage has been found in sheep from two of the properties on King Island where the fungus has been detected and these are the only known cases of disease in sheep, which could be associated with *Pythomyces*, that have occurred in Tasmania.

The method does not enable one to determine whether pathogenic strains are present, but it appears that the fungus is a potential danger in some districts of Tasmania, and could lead to losses if favourable weather conditions occurred.

G.C. WADE

Department of Agriculture,
HOBART.